NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WETLAND RESTORATION

(acre)

CODE 657

DEFINITION

A rehabilitation of a drained or degraded wetland where the soils, hydrology, vegetative community, and biological habitat are returned to the natural condition to the extent practicable.

PURPOSE

To restore hydric soil conditions, hydrologic conditions, hydrophytic plant communities, and wetland functions that occurred on the disturbed wetland site prior to modification to the extent practicable.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies only to sites with hydric soil, which were natural wetlands that have been previously degraded hydrologically and/or vegetatively.

This practice is applicable only if natural hydrologic conditions can be approximated by modifying drainage and/or artificial flooding of a duration and frequency similar to natural conditions.

If the presence of hazardous waste materials in the sediment or fill is suspected, soil samples will be collected and analyzed for the presence of hazardous waste as defined by local, State, or Federal authorities. Sites containing hazardous waste will not be restored under this standard.

This practice does not apply to: a Constructed Wetland (656) intended to treat point and non-point sources of water pollution; Wetland Enhancement (659) intended to rehabilitate a degraded wetland where specific functions and/or values are enhanced beyond original conditions; or Wetland Creation (658) for creating a wetland on a site which historically was not a wetland or was formerly a wetland and will be replaced with a wetland type not naturally occurring on the site.

CRITERIA

General Criteria

Upon completion of the restoration the site will meet the current NRCS soil, hydrology, and vegetation criteria of a wetland.

The soil, hydrology and vegetative characteristics existing on the site and the contributing watershed shall be documented before restoration of the site begins.

The landowner shall obtain necessary local, State, and Federal permits that apply before restoration. Water rights shall be assured prior to restoration if required.

Structures with a water storage capacity (spillway elevation) exceeding 12½ acre-feet require a Form 108 Conditional Water Permit from the North Dakota State Water Commission (SWC) prior to construction or modification activities.

All wetland restorations require completion of the form SFN511695 Application/Notification to Construct or Modify Dam, Dike, Ring Dike or Other Water Resource Facility from the SWC. Structures with maximum water-retaining capacity (top of structure) exceeding 12½ acre-feet require approval from the SWC before commencement of construction or modification.

Criteria for Hydric Soil Conditions

Restoration sites will be located on hydric soils. If the hydric soil is covered by fill, sediment, spoil, or other depositional material, the material covering the hydric soil shall be removed only to the surface of the buried (or original) hydric soil.

Reestablish an approximation of the original soil microtopography.

Criteria for Hydrology Restoration

The hydrology of the site is defined as the rate, path, and timing of inflow and outflow; duration, frequency, and depth of flooding, ponding or saturation occurring on the site.

To the extent practical, the maximum hydrology and the overall hydraulic variability of the restored site will approximate the conditions that existed before alteration, e.g., dynamic and static water levels, soil saturation.

Lateral effects of artificial drains in the adjacent upland shall be removed to the extent practical.

The standards and specifications for Structure for Water Control (587) will be used as appropriate. Refer to the Engineering Field Handbook, Chapter 13, "Wetland Restoration, Enhancement, and Creation," and Chapter 6, "Structures," for additional design information.

Existing drainage systems will be utilized, removed, or modified as needed to achieve the intended purpose.

Criteria for Vegetation Restoration

The vegetation shall be restored as close to the original natural plant community as the restored site conditions will allow. Determination of the original plant community's species and percent composition shall be based upon reference wetlands of the type being restored or suitable technical reference such as Stewart and Kantrud (1971).

Plantings, seeding, or other types of vegetative establishment will be comprised of native species that occur on the wetland type being restored.

Preference shall be given to native wetland plants with localized genetic material. Plant materials collected or grown from material collected within a 200-mile radius from the site is considered local.

In soils where seed banks realistically exist, or where natural colonization of selected native species (identified from reference wetlands) will dominate within 5 years, natural regeneration can be allowed. Specific guidelines that consider soil, seed source, and species will be developed by the States.

Adequate substrate material and site preparation necessary for proper establishment of the selected plant species shall be included in the design.

On sites which were predominantly herbaceous vegetation prior to modification and planting and/or seeding is necessary, the minimum number of native species to be established shall be based upon the number of ecological sites present. Sites restored to only one ecological site shall be established with at least two species adapted to the site. Sites with two or more ecological sites (i.e., wet meadow, shallow marsh, or slough eco-sites, etc.) shall be established with at least one native species on each ecological site.

Herbaceous vegetation may be established by a variety of methods including: mechanical or aerial seeding, topsoiling, organic mat placement, wetland sod, vegetative sprigs, wetland hay, etc., over the entire site or a portion of the site and at densities and depths appropriate.

Forested wetland plantings and/or seeding will include a minimum of three tree or shrub species on each ecological site (i.e., low flat, bottom ridge eco-sites, etc.), where appropriate. Tree (and shrub) planting will follow the criteria of conservation practice Tree Planting (612). Seed planting rates and site preparation will meet the criteria of conservation practice Woodland Direct Seeding (652). Seed viability will be determined prior to planting.

Criteria for Wetland Functions

Restoration goals and objectives shall include targeted natural wetland functions for the wetland type and the site location as determined by the functional assessment and reference site data. A post-project assessment will be performed after an adequate time period to assess the success of the restoration.

CONSIDERATIONS

Consider effect of volumes and rates of runoff, infiltration, evaporation, and transpiration on the water budget.

Evaluate the potential for a change in rates of plant growth and transpiration because of changes in the volume of available soil water.

Consider effects on downstream flows or aquifers that could affect other water uses or users.

Consider effects on wetlands or water-related resources and wildlife habitats that would be associated with the practice.

Consider as a high priority those sites adjacent to existing wetlands as they increase wetland system complexity and diversity, decrease habitat fragmentation, and ensure colonization of the site by wetland flora and fauna.

Consider linking wetlands by corridors wherever appropriate to enhance the wetland's use and colonization by the flora and fauna.

Consider the effects of varying water levels in response to potential climatic events such as wet or dry periods.

Consider changes in salt movement / concentrations in the soil resulting from hydrologic alterations.

The nutrient and pesticide tolerance of the plant species planned should be considered where known nutrient and pesticide contamination exists.

Consider effects of temperature on water resources to prevent undesired effects on aquatic and wildlife communities.

For discharge wetlands, consider upslope water/groundwater source availability.

To minimize sediment delivery to the wetland, conservation treatment should be planned that will prevent soil loss exceeding NRCS tolerance level (T) from the soil(s) in the watershed area controlled by the cooperator.

Around wetlands with cropped or similarly disturbed watersheds, consider establishing Filterstrip (393) to reduce delivery of sediment and soluble and sediment-attached substances carried by runoff.

Consider leaving a thin sediment overburden if removing it will destroy a high quality plant community, i.e., diverse, native, and dominated by perennial species. If heavy overburden is to be removed where a high quality plant community exists, consider stockpiling and re-spreading the top 2-4 inches of soil to utilize propagules.

Consider scheduling fieldwork to avoid soil compaction, e.g., when soil is not saturated.

A functional assessment (Hydrogeomorphic Approach or similar method) of the wetland may be performed prior to restoration to establish a base for measuring increases in wetland functions.

PLANS AND SPECIFICATIONS

Specifications for this practice shall be prepared for each site. Specifications shall be recorded using approved specifications sheets, job sheets, narrative statements in the conservation plan, or other documentation.

Requirements for the operation and maintenance of the practice shall be incorporated into site specifications.

OPERATION AND MAINTENANCE

The following actions shall be carried out to ensure the practice functions as intended throughout its expected life. These actions include normal repetitive activities in the application and use of the practice (operation), and repair and upkeep of the practice (maintenance):

Determine if treatments such as fertilizers, mechanical treatments, burning, pesticides and other chemicals have compromised the intended purpose of wetland restoration, and plan remedial treatment.

Biological control of undesirable plant species and pests (e.g., using predator or parasitic species) shall be implemented where available and feasible.

Establish timing and level setting of water control structures required for the establishment of desired hydrologic conditions or for management of vegetation.

Establish an inspection schedule for embankments and structures for damage assessment.

Establish a depth of sediment accumulation to be allowed before removal is required.

Plan management needed to maintain vegetation, including control of unwanted vegetation.

On sites used for forage production, haying and livestock grazing plans will be developed to allow the establishment, development, and management of wetland and associated upland vegetation.

Guidance for operation and maintenance items that might be appropriate to the wetland site can be found in the Site Visit Checklist, Appendix B, Chapter 13, NRCS Engineering Field Handbook.

REFERENCES

Stewart, R.E. and H. A. Kantrud. 1971. *Classification of Natural Lakes and Ponds in the Glaciated Prairie Region*.

Resource Publication 92, Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service, USDI, Washington, D.C.